



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,734	04/02/2004	Taiji Torigoe	2004-0509A	1544
513	7590	07/27/2006	EXAMINER	
WENDEROTH, LIND & PONACK, L.L.P.			IVEY, ELIZABETH D	
2033 K STREET N. W.			ART UNIT	
SUITE 800			PAPER NUMBER	
WASHINGTON, DC 20006-1021			1775	

DATE MAILED: 07/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/815,734

Applicant(s)

TORIGOE ET AL.

Examiner

Elizabeth Ivey

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24,32 and 34-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24,32 and 34-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 25, 2006 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

Art Unit: 1775

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 24, 32 and 34-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6025078 to Rickerby in view of U.S. Patent Application Publication 2003/0138641 to Fukudome et al. further in view of U.S. Patent Application to Nagaraj et al.

Regarding claims 24, 32 and 34-39, Rickerby discloses a metallic turbine engine component article comprising a metallic bond coat such as an aluminide or MCrAlY and a ceramic thermal barrier coating based on zirconia stabilized with an oxide such as ytterbia which can range in an amount from 9-45% and discloses it affects thermal conductivity (column 1 lines 5-10 and column 2 lines 24-32 and 44-67). Rickerby does not disclose cracks formed in the ceramic coating or porosity percentage contained in the ceramic coating. However, Fukudome discloses a 5-200 μ m thick ceramic surface protection (thermal barrier) layer for a turbine engine component comprising ytterbia stabilized zirconia. Fukudome discloses the zirconia is stabilized with 3-15% ytterbia and discloses the % ytterbia content advantageous to improve resistance to oxidation, erosion and corrosion. Fukudome discloses cracks formed in the (vertical) columnar interfaces thereby helping to prevent peeling of the interface from the bond coat. Fukudome also discloses a porosity of 5-30% overlapping the claimed range of 8-15% and discloses the porosity to relax the stress due to the difference in thermal expansion between the substrate and the thermal protection layer (paragraphs [0018]-[0020] and [0022]). Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to provide one or more stabilized zirconia coatings of Fukudome as a thermal/ protective barrier in the invention of Rickerby to provide improved oxidation, erosion and corrosion resistance and a relaxation of the stress due to the difference in thermal expansion between the substrate and the thermal protection

Art Unit: 1775

layer. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the overlapping portion of the ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, In re Malagari, 182 USPQ 549. Neither Rickerby nor Fukudome explicitly disclose cracks that go through the thickness of the ceramic thermal barrier layer. However, Nagaraj discloses dense vertical microcracks extending through a ceramic thermal barrier layer. Nagaraj discloses that these microcracks provide better erosion resistance (paragraph [0010] and figure 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to provide dense (with an interval between cracks of .05-1 times the thickness of the ceramic layer) microcracks in the thermal barrier coating of Rickerby and Fukudome to further improve erosion resistance.

Response to Arguments

Examiner acknowledges Applicant's amendment to claim 24 and cancellation of claims 25-31, 33 and 40-42.

Applicant's arguments with respect to claims 24, 32 and 34-39 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Ivey whose telephone number is (571) 272-8432. The examiner can normally be reached on 7:00- 4:30 M-Th and 7:00-3:30 alt. Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Elizabeth D. Ivey



JOHN J. ZIMMERMAN
PRIMARY EXAMINER